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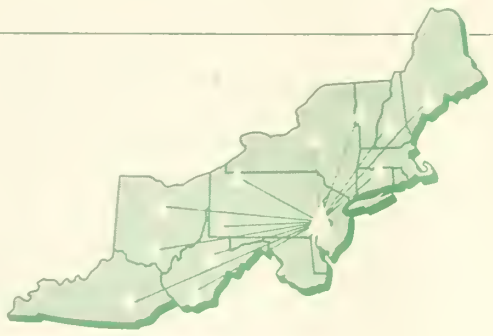

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ELIMINATION OF SCATTERED RESIDUAL SAPLINGS LEFT AFTER CLEARCUT HARVESTING OF APPALACHIAN HARDWOODS

Abstract.—Basal-spraying and power-saw felling were compared as methods for eliminating the 1- to 5-inch d.b.h. understory stems left after clearcutting. Felling leaves the area more esthetically acceptable, and costs are lower.

When mature Appalachian hardwoods are clearcut down to a 5-inch diameter (d.b.h.)—minimum for pulpwood-size stems—a number of living 1- to 5-inch stems are left standing. These stems are almost always too few, and many of them of too poor quality, to form a satisfactory new stand. And, scattered and exposed as they are, they are potential wolf trees with the inherent capacity to interfere with the development of the new reproduction. Whether to eliminate them—and if they are to be eliminated, how and when?—are questions of immediate concern to foresters.

Under the assumption that eliminating these small stems is worthwhile—and research has not as yet established under what conditions it is economically justified—we studied methodology and timing, based on operations in West Virginia. Two methods of elimination were compared: basal spraying and cutting with power saws. Timing and costs of these operations are discussed. We recognize that labor costs will vary from those shown here by time and location, but the user of this information can apply his own per-hour labor rates.

Study Results

Number of stems.—Tallies made on a number of 5- to 80-acre compartments in the Fernow Experimental Forest, near Parsons, West Virginia, showed that the number of 1-to 5-inch stems per acre in sawlog stands varies greatly, ranging from as few as 150 to over 700. More commonly, the numbers range between 300 and 600, and generally about half of them are in the 1- to 2-inch d.b.h. class.

When the stands are clearcut down to 5 inches d.b.h., about two-thirds of these small stems are broken off or knocked down in logging.

Basal-spraying understory stems.—We tested basal spraying of small stems on three clearcut areas totaling 98 acres (table 1). We used 2,4,5-T in fuel oil at a concentration of 14 pounds ahg., applied with a 2½-gallon handpump sprayer. Treatment costs, including labor and cost of materials, ranged from 2.3¢ to 3.4¢ per stem and from $6.05 to $9.59 per acre. With the data available, it was not possible to determine if time of treatment (before

Table 1.—Costs of basal spraying

Area No.	Acreage	Timing of operation	Size of stem treated	Stems treated /acre	Stems treated /hour	Man-hours /acre	Labor cost /acre at $2/hour	Spray cost /acre at $0.01/stem	Total costs	
									Per acre	Per stem
	Acres		*Inches*	*No.*	*No.*	*Man-hours*	*$*	*$*	*$*	*$*
C. 38	13	After logging	1-5	265	152	1.70	3.40	2.65	6.05	0.023
C. 36	12	After logging	1-5	279	82	3.40	6.80	2.79	9.59	.034
WS #3	73	Before logging	2-5	212	90	2.40	4.80	2.12	6.92	.033

Table 2.—Costs of felling

Area No.	Acreage	Timing of operation	Size of stems treated	Stems treated /acre	Stems treated /hour	Man-hours /acre	Labor costs /acre at $2/hour	Cost of power saw /acre at $0.25/hr.	Total cost	
									Per acre	Per stem
	Acres		*Inches*	*No.*	*No.*	*Man-hours*	*$*	*$*	*$*	*$*
C. 17B	2.0	Before logging	1-5	592	237	2.50	5.00	0.625	5.62	0.010
C. - Tier 3	2.0	Before logging	1-5	722	321	2.25	4.50	.562	5.06	.007
Cold Spring sale	4.0	After logging	1-5	107	122	.88	1.76	.220	1.98	.019

or after logging) affected costs. Spray materials cost about 1¢ per stem (with very little variation between areas), and labor costs were computed at $2 per hour. Only on-the-ground costs were considered; car travel and overhead costs were not included.

Mortality of treated stems varied. Based on previous mortality studies for this kind of treatment, we can expect a kill of 80 to 90 percent of treated stems.

Felling with power saw.—We tested power-saw cutting to eliminate the small stems on three areas totaling 8 acres (table 2). We used a small McCulloch saw with a 1-quart fuel tank (Mac 10-10 Automatic) and cut the stems about 6 inches above the ground.

On two of these areas, the stems were cut before logging (fig. 1); on one, they were cut

Figure 1.—Stems cut before logging. Left on the ground, they interfere with the logging operation.

a few months after clearcutting. Where the cutting was done before logging, costs per acre were $5.62 and $5.06; costs per stem were 1¢ and 0.7¢. On the area where cutting was done after logging, the job cost $1.98 per acre and 1.9¢ per stem. After-logging treatment was cheaper per acre because there were fewer stems per acre to treat, but it was more costly per stem because of more walking time between the wider-spaced stems.

Labor cost was computed at $2 per hour and power-saw costs at 25¢ per hour (maintenance, depreciation, and fuel). As with the basal-spraying tests, only on-the-ground costs were considered.

Discussion and Recommendations

There are situations where the forester may wish to leave the 1- to 5-inch stems as a source of the next stand. These would be where the number of stems and the species composition are such that they promise a desirable potential new stand. Although such situations are probably rare, they should be recognized. For example, in northern hardwoods, where sugar maple is a desirable new crop, there may be enough 1- to 5-inch stems of this species to form the nucleus of a new forest.

Use of power saws to eliminate the small stems was considerably cheaper than basal spraying. Some of this difference may be due to the fact that the sample areas where power-saw cutting was used were easier to work in than areas where basal spraying was used. Moreover, the felling areas were smaller, necessitating less prolonged and tiring labor. In spite of this, indications are that cutting was actually cheaper. Moreover, use of power saws was 100 percent effective, and the best that can be hoped for in basal spraying is 80 to 90 percent effectiveness.

Cutting has another advantage over basal spraying. Since the stems are dropped on the ground in cutting, the looks of the area are improved tremendously; and this is a big consideration in pleasing an esthetically-minded public (figs. 2 and 3).

The best time to cut these stems is during the first year after logging. After that, the brush grows up so fast that the difficulty and hazard of carrying out this operation are both

Figure 2.—The 1- to 5-inch stems were cut a few months after logging. Laid on the ground, they present little adverse visual impact.

Figure 3.—Treated with a basal spray, unsightly dead stems like these remain standing for several years.

drastically increased. Although cutting is easier before logging, so many more stems must be cut per acre that per-acre costs are higher than for cutting after logging. In addition, if the stems are cut before logging, the costs of logging are probably increased because of the difficulty of working in the debris on the ground (fig. 1).

Many foresters think that 1- to 2-inch stems do not need to be eliminated. If decision is made to cut only the 2- to 5-inch stems (and leave the 1- to 2-inch stems standing), then on the average only about half as many per acre will require treatment.

In summation, we recommend that, where a decision has been made to eliminate the small stems, a power saw be used to do the job; that the operation be timed to follow logging as soon as possible; and that every effort be made to complete it before the second growing season. By all means, the job should be done before the third growing season.

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